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DESCRIPTIONS OF TWO NEW SPECIES OF SOUTH AMERICAN *OLIARUS* STÅL (HOMOPTERA: FULGOROMORPHA: CIXIIDAE), INCLUDING A RICE-ASSOCIATED SPECIES FROM PERU

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Abstract.—Two new species of *Oliarus* are described, ***O. oryzicola*** from Peru and ***O. kindli*** from French Guyana. Biological notes are given for *O. oryzicola* which feeds on rice.

Key Words: *Oliarus*, Peru, French Guyana, rice-associated

The majority of planthopper (Fulgoroidea) species that occur on rice (*Oryza sativa*) throughout the world are members of the family Delphacidae (Wilson and Claridge 1991). This is, perhaps, not surprising because so many delphacid species are associated with Graminae. When individuals of some other planthopper families are found on rice, including the family Cixiidae, they are usually considered to be 'casuals' and have little or no importance as pests.

The extensive literature search of Wilson et al. (1994) lists only one species of cixiid, *Pentastiridius apicalis* (Uhler) on rice. In this paper we report a new species of *Oliarus* on rice in Peru. In the course of investigations on this species we found a second closely related species and take the opportunity to also describe it.

Abbreviations of depositories are BMNH: The Natural History Museum, London, U.K.: MNHN: Muséum National d'Histoire Naturelle, Paris, France; USNM: National Museum of Natural History, Smithsonian Institution, Washington, D.C. U.S.A.

The Genus *Oliarus*

Members of the genus *Oliarus* Stål, as currently diagnosed, are found in almost all parts of the world. Species discrimination depends entirely on examination of the male genitalia, in particular on the structure of the aedeagus. Mead and Kramer (1982) revised the *Oliarus* species in North America (north of Mexico) and recognized 51 species. These authors were conservative in their treatment of the genus and did not use any of the current subgenera but did recognize a series of species groups based on the structure of the aedeagus. We follow the same principles here, and, in the absence of any phylogenetic analysis of *Oliarus*, we indicate possible phylogenetical links of the two new species with a previously described one. Over 20 *Oliarus* species have been recorded from Central and South America and from the Galapagos islands. Unfortunately many of the species are based on female type specimens and until characters based on the female are fully investigated we cannot compare them with any degree of confidence. We accept the

possibility that the two species described here may become synonyms with further revisionary study of the South American cixiid fauna.

The morphological terminology follows Mead and Kramer (1982). According to Bourgoin and Huang (1990) the male periandrium ends at level of the process 5 (aedeagal joint level in Mead and Kramer 1982) where the ligamentary processes are fused with the aedeagus (= flagellum, Mead and Kramer 1982). The dorsal membranous part of the periandrium corresponds to endotheca in direct prolongation with the sclerotinized part or phallotheca. The aedeagus sensus stricto is followed by a membranous endosoma.

Oliarus oryzicola Bourgoin, Wilson, and Couturier, new species

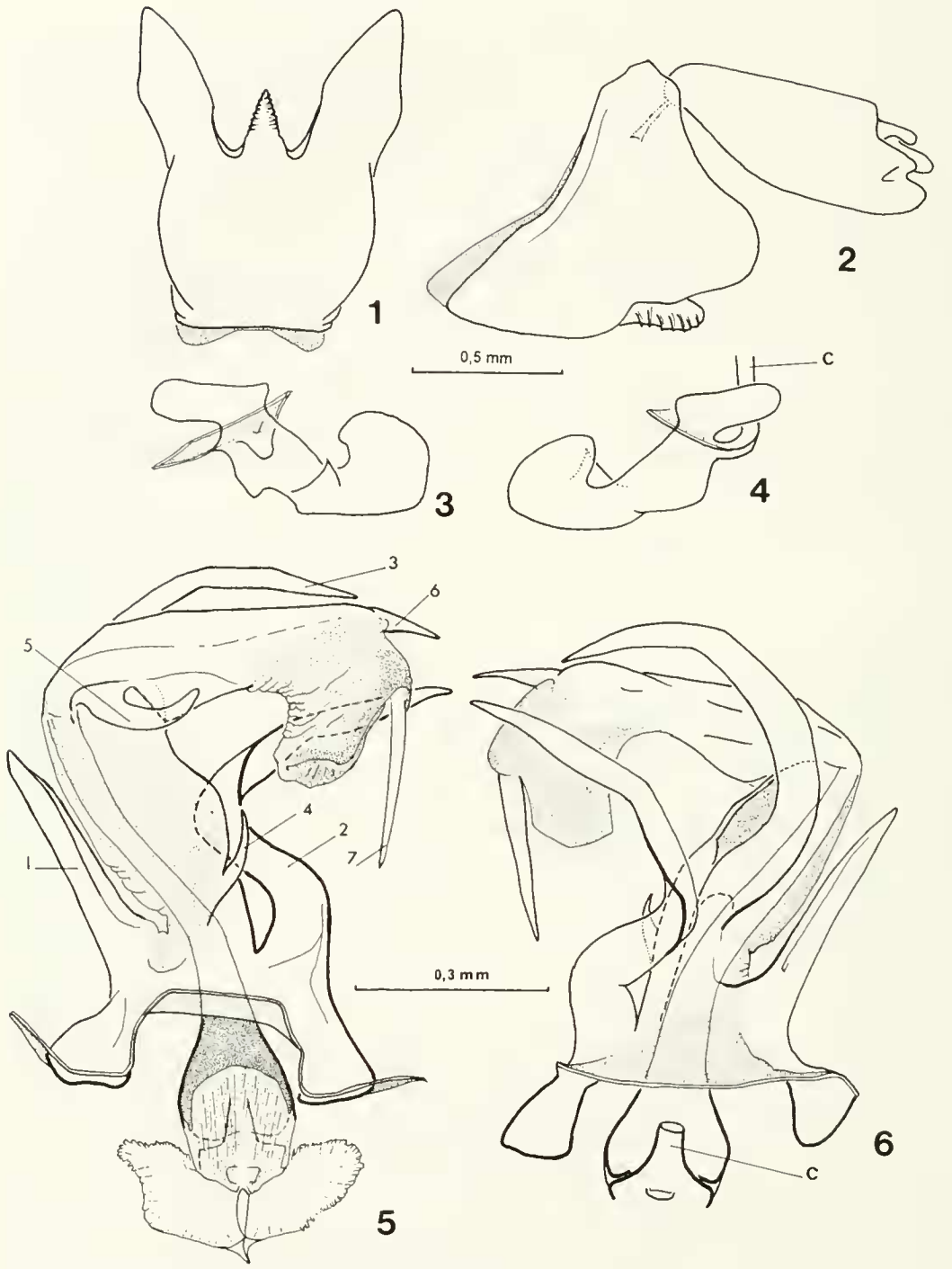
(Figs. 1–6)

Diagnosis.—*Oliarus oryzicola* can be separated from other *Oliarus* spp. by the combination of the following male genitalia characters: anal segment without posterior process, medioventral process of the pygofer shorter than the lateral lobes; in ventral view: apex of aedeagus facing anteriorly but not passing behind dorsal side of periandrium; in ventral view three long spine-like periandrium processes (Fig. 5: 1, 2, 3) and one subapical endosomal process (Fig. 5: 7). All these characters lead to *O. humilis* (Say) (Mead and Kramer, 1982) and to the two new species described here. From *O. humilis* it can be separated by the presence of a long lateral aedeagal process (Fig. 5: 6) not separated from the aedeagus. From *O. kindli* sp. nov. *O. oryzicola* is separated by the comma-like basal aedeagal process (Fig. 5: 5) which is S-shaped in *O. kindli*.

Description.—Length, male 5.6–6 mm; female 7.7–7.9 mm. Vertex longer at lateral margin than broad at level of anterior margin of eyes; posterior margin strongly notched, lateral margins elevated; media carina feebly marked on its basal half. Frons with media carina prominent; intercarinal areas dark in color; carinae tawny; basal fork of media carina short. Rostrum surpassing metacoxa; apically black. Pronotum with intermediate carina attaining pale band of posterior margin; medium to dark brown. Mesonotum with median carina prominent; intermediate, arcuate, and lateral pairs weaker, diverging distally; medium to dark brown; tegula paler. Tegmina hyaline; tubercules very short, concolorous with pale yellow veins; stigma pale brown. Legs yellowish, generally 4 tibial (3–5) spines: two small basal ones, and others longer. Metatibiotarsal formula 6/7/7. Male anal segment in dorsal view subovate; longer than broad; posterior margin concave; lateral margin of anal foramen clearly elevated and thickened.

Male genitalia: Pygofer as in Figs. 1, 2; medioventral process conical, triangular in ventral view, clearly marked with little parallel ridges on each side; extending posteriorly slightly less than half as far as lateral lobes of the pygopher in ventral view. Lateral lobes well produced, nearly symetrical, diverging distally in ventral aspect. Aedeagal complex as in Figs. 5 and 6. In dorsal view, periandrium with right process (1), strong, moderately long, more or less short; not surpassing posterior margin of periandrium; distally spinose. Left process longer (2); basally wider, slightly turning right then produced left in a strong spinose process. A short medio-dorsal acute process (4), sometimes very short, tooth-like. At aedeagus base level a stronger process, transversal and comma-like (5). In ventral view a strong medio-ventral spinose process (3), turning left, surpassing posteriorly aedeagus and reaching base of the subapical aedeagal process (6); this process strong and short, directed left. Subapical endosomal process (7), spinose, short, slender and long, directed cephalad. Gonostyli (Figs. 3 and 4) apically rounded and recurved; a short internal rounded process basally; an acute blade-like tooth pointing dorsad more apically.

Etymology.—Named for the rice association.



Figs. 1–6. *Oliarus oryzicola*, male genitalia. 1, Pygofer from below. 2, Pygofer and anal segment, lateral view. 3, Paramere, left view. 4, Paramere, right view. 5, Aedeagus, dorsal view. 6, Aedeagus, ventral view.

Material examined.—Holotype ♂: Perù—Loreto, Jenaro Herrera, 12.VI.92, G. Couturier col., Systema agrofor. H.i.s., ex larva, on roots of rice, MNHN-HF-93-2. Paratypes as follows: 8 ♂, 2 ♀ same data as holotype (5 ♂, 2 ♀, MNHN) (1 ♂, 1 ♀, Universidad National Agraria La Molina, Lima, Peru); (1 ♂, 1 ♀, BMNH); (1 ♂, USNM). The specimens were collected 500 m from the River Ucayali, close to the village Jenaro Herrera (4°55′ S, 73°40′ W), 200 km southwest of Iquitos, at an experimental field of the "Instituto de Investigacion de la Amazona peruana" (IIAP).

Other specimens examined.—4 nymphs, same data as holotype.

Distribution.—Peru

Biology.—Specimens were found on *Oryza sativa*, local variety "Inti." Between 5–20 nymphs were found on each clump of rice plants, living on the roots (Couturier et al. 1995). The fields are annually flooded for several months and called "restinga" in Peruvian amazonia. The rice is sown as the waters recedes. Nymphs of cixiids are normally found feeding on the roots of a wide range of host plants. The analysis of Wilson et al. (1994) showed that most records of nymphal feeding by cixiids originated from grasses while most adult records were from woody plants.

Remarks.—The name of the species but without any description was mentioned by Couturier et al. (1995).

Oliarus kindli Bourgoin, Wilson, and Couturier, new species

(Figs. 7–9)

Diagnosis.—*Oliarus kindli* may be isolated from other *Oliarus* species by the same combination of male genitalia characters listed for *O. oryzicola*, which leads to *O. humilis* (Say) using Mead and Kramer's key (1982). From *O. humilis* this species can be separated by the presence of a long lateral aedeagal process (Fig. 8: 6) not separate from the aedeagus and similar to the one observed in *O. oryzicola*, but stronger and longer. The S-shaped basal aedeagal process (Fig. 8: 5) is very distinctive.

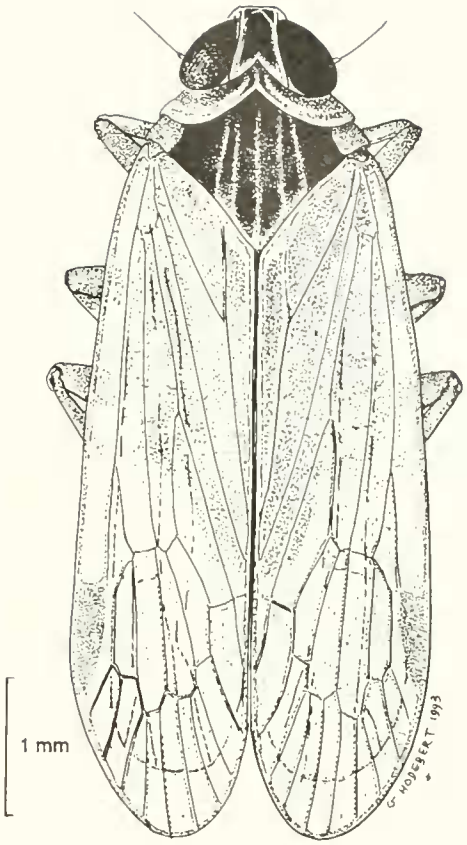
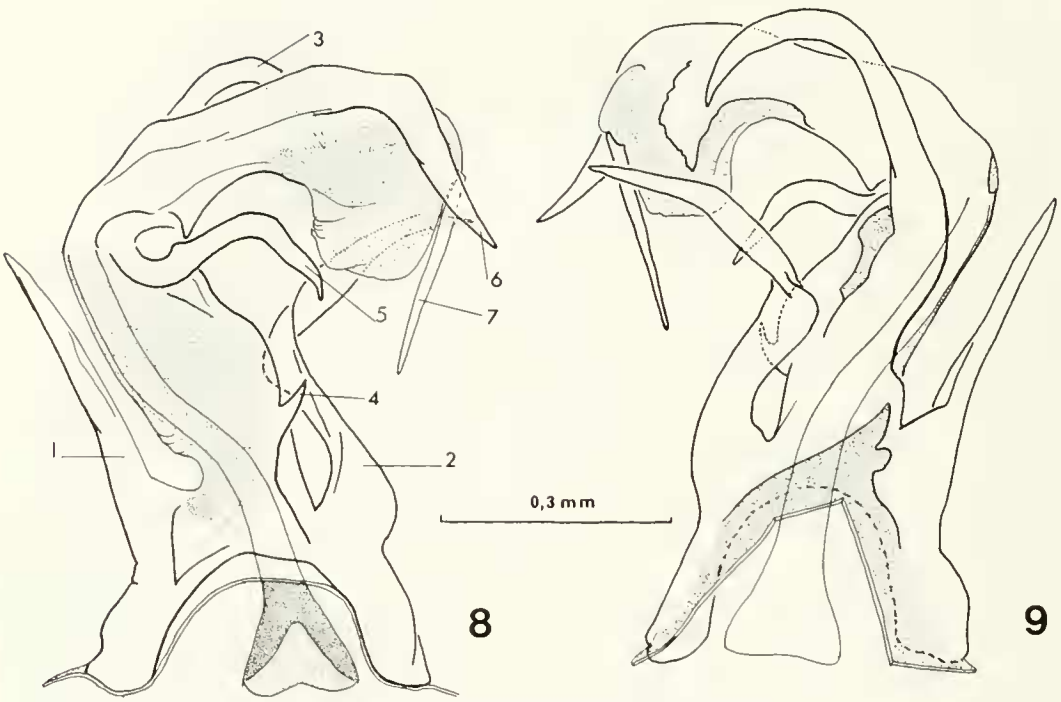


Fig. 7. *Oliarus kindli*, habitus

Description.—Length, male 5.5–6.2 mm; female 6.5–8 mm. Externally very similar in appearance to *O. oryzicola*.

Male genitalia: Anal segment in dorsal view subovate; longer than broad; posterior margina clearly concave; lateral margin of anal foramen clearly elevated and thickened. Pygofer as in previous species. Aedeagal complex as in Figs. 8, 9. In dorsal view, periandrium with right process (1), strong, long and stout, reaching level of aedeagus; distally spinose. Left process (2) longer; basally wider, slightly turning right then produced left in a strong spinose process. A short medio-dorsal acute process (4), sometimes very short. At aedeagus base level (posterior margin of periandrium) a twice recurved spinose



Figs. 8–9. *Oliarus kindli*, male genitalia, aedeagus. 8. Dorsal view. 9. Ventral view.

process (5), transverse, S-shaped: turning first latero-posteriorly at 90° then turning cephalad at 90°. In ventral view a strong medio-ventral spinose process (3), turning left, surpassing posteriorly aedeagus and turning left again pointing more or less anteriorly. Subapical endosomal aedeagal process (6) strong, in direct prolongation of aedeagus, directed left and cephalad. Subapical endosomal process spinose, short, slender and long, directed cephalad. Gonostyli apically rounded and recurved; a short rounded internal and dorsal process basally; an acute blade-like tooth pointing dorsad more apically, stronger than in previous species.

Etymology.—Named for the collector, P. Kindl.

Material examined.—Holotype ♂: labelled: Guyane Française, Piste Coralie pk 02-28.I.1993, P. Kindl rec., Museum Paris, Holotype, MNHN-HF-93-3. Paratypes as follows: 15 ♂, 17 ♀ same data as holotype (12 ♂, 14 ♀ all with sex label, red paratype label and MNHN-HF-93-3, MNHN) (2 ♂, USNM) (1 ♂, 3 ♀, BMNH).

Other specimens examined.—133 specimens from French Guyana, Pk 2 Piste Coralie, L. Sénécaux rec. (various date) and 26 specimens: Guyane Française, Piste Dégrad Corréze, RN2, pk 62-26.XI.1992, P. Kindl rec. (MNHN). 2 ♂ and 1 ♀ from Brazil: env. de Belèm, Sao Antonio, 27.IX.1975/ Moyen Xingu (Brésil), Mission M. Boulard, P. Jauffret & P. Pompanon, Muséum Paris (MNHN).

Distribution.—French Guyana, Brazil.

Remarks.—This species is very similar to the previous species and the two obviously belong to the same species group. The form of the apical periandrium process (Figs 5, 8: 5) and of the subapical aedegal process (Figs 5, 8: 6) give the best characters to separate the two. In the Brazilian specimens the apical periandrium process is a little shorter than in the Guyanan ones.

Conclusions

These two new species have a similar pygofer and male genitalia conformation to *O. humilis* (Say) as figured by Mead and Kramer (1982) with the exception that the medio-dorsal periandrium process is absent in the two South American species. The possession of this character seems too important to allow the recognition of a '*humilis*' species-group in a way similar to that proposed by Mead and Kramer (1982) for several other *Oliarus* species. Moreover, *O. humilis* is distributed mainly in the northern half of the United States and southern Canada; in Southern United States it only reaches northern Arizona (Flagstaff) and New Mexico (Albuquerque). However, it is interesting to note that both *O. oryzicola* and *O. kindli* share also several characters with another species-group distributed in the Galapagos as figured by Fennah (1967). Fennah has related this species, represented by *O. galapagensis* Van Duzee to *O. concinnulus* Fowler and *O. franciscannus* Stål.

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